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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/813,589

03/30/2004

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SIL.P0078

4323

30163 7590 12/07/2010
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EXAMINER

SHINGLETON, MICHAEL B

ART UNIT

PAPER NUMBER

2815

MAIL DATE

DELIVERY MODE

12/07/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

DETAILED ACTION***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 57-76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koinuma US4,451,802 (Koinuma) in view of King US 6,300,827 (King), Engbretson US5,311,150 (Engbretson), Dudley et al. US5,144,133 (Dudley) and Lu et al. US 6,009,023 (Lu).

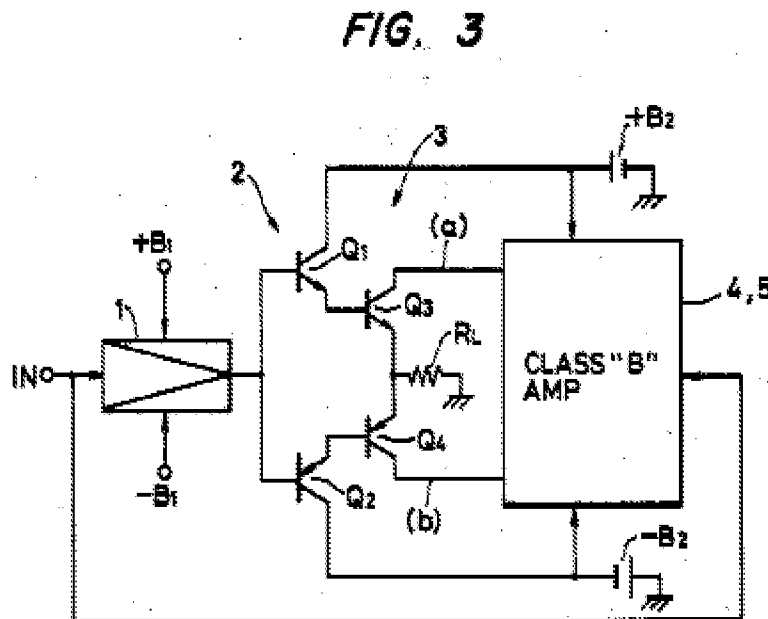


Figure 3 and the relevant text of Koinuma disclose a power amplifier arrangement and method of providing an amplifier with a preamplifier 1 (input stage) and an output stage (2 and 3) that is supplied with two different power sources (B_1 and B_2). The voltage B_2 is of a greater magnitude than that of B_1 . (See column 3, around line 36)

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Since the power supplies $\pm B_2$ for the class B amplifier circuits are greater in level and in capacity than the power supplies $\pm B_1$ of the voltage amplifying stage 1 of the class A amplifier circuit, 40

Column 3, around line 36 of Koinuma.

Koinuma also discloses in column 1, around line 9 that the amplifiers are such that they can be classes such as class A, B and are used for powering a loudspeaker or "otherloads" (sic).

Amplifiers for delivering output power to loudspeakers or otherloads include class A and class B power amplifier circuits. 10

Column 1, around line 9 of Koinuma.

Koinuma is silent on exactly what the other loads are specifically, but never the less Koinuma teaches that the invention applies to other loads as well.

One well known "other load" for a class A, B etc. amplifier is for the wireless transmission system, i.e. a cellular telephone that includes a transceiver and an antenna as evidenced by King (See the abstract and column 7, around line 21.)

(57)

ABSTRACT

A cascaded amplifier is integrated within an integrated circuit with a cascaded ground bus. The cascaded ground bus provides two ground points at opposite ends. Each amplifier ground of each amplifier stage couples to the ground wire there between. The cascaded ground bus substantially reduces the parasitic inductance in the emitter leg of each IC transistor within each amplifier. The lay out of the cascaded ground bus wire is tightly coupled to the lay out of the input wires so that their respective parasitic inductances are magnetically coupled together to form a mutual inductance. The mutual inductance effectively cancels the effect of the ground return inductance due to them being similar inductance values and having the same ground loop current flowing through them in opposite directions. The cascaded ground bus can be utilized in substantially all amplifier types including class A, B, C, D, BD, E, F, G, H, S and their variations and with substantially all transistor types used within amplifier stages including bipolar junction transistors, field effect transistors and their variants (i.e. PNP, NPN, MOSFET, NFET, PFET, JFET, MESFET, etc.). An IC cascaded amplifier with the cascaded ground bus can be utilized in a number of communication systems where amplification is needed including battery operated systems such as a transceiver of a portable cellular telephone.

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Column 7, around line 21 of King.

King is very clear that the amplifier class to be used in Cellular arrangements is that of class A, B, C, etc.. Cellular arrangements clearly have an antenna that is necessary for transmission and reception (receiving). Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have replaced the "other load" of Koinuma with a wireless transmission/reception system because as the Koinuma reference is silent on the exact structure of the "other load" one of ordinary skill in the art would have been motivated to use any art-recognized equivalent load such as the cellular antenna with transceiver as taught by King. Note that by using the arrangement of Koinuma to power an antenna that this makes the power amplifier an "RF power amplifier".

In addition to that above Koinuma is silent on the use of a CMOS based preamplifier and CMOS based output stage. Koinuma utilizes bi-polar transistors for the transistor elements in the output stage. It is commonly known but Engbretson shows that a FET is an equivalent structure to a bi-polar design. See column 5, around line 63.

although the schematic diagrams show a bipolar transistor-based circuit, it is known by those skilled in the art that an equivalent FET-based circuit can be built.

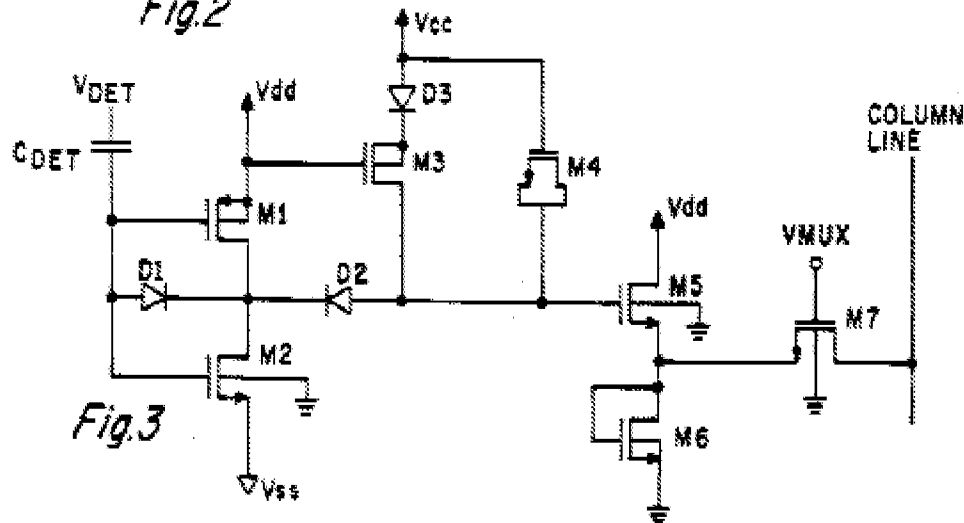
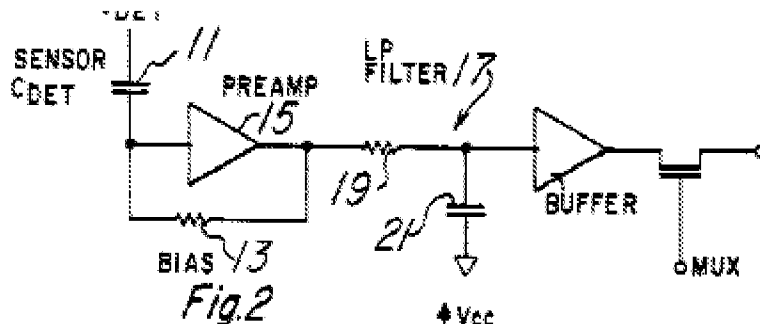
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Column 5, around line 63.

Therefore, because these two transistor structures were known as art-recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute the FET structure for the bipolar elements in Koinuma.

As to the CMOS input stage, Koinuma is silent on the exact construction of this stage. This is evidence that a conventional amplifier stage could be used. A specific structure that would be required other than the conventional is not recited and all Patents are presumed valid. 35 USC 282. Dudley in Figures 2 and 3 specifically recites that one conventional preamplifier stage is one that uses CMOS technology and thus that would inherently include FET structure.

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Figures 2 and 3 of Dudley.

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the generic amplifier of Koinuma with a CMOS based unit because as the Koinuma reference is silent on the exact structure of the preamplifier stage one of ordinary skill in the art would have been motivated to use any art-recognized equivalent preamplifier structure such as the CMOS based structure of Dudley.

In the combined structure made obvious above, the prior art is silent on mentioning the exact thicknesses of the input CMOS stage and the FET based output stage. However, it is commonly known that the lower operating voltage MOSFETs utilize a thinner oxide layer as compared to the higher operating voltage MOSFETs so that the thicker gate oxide layers can “reliably sustain higher voltages”. Note abstract of Lu. Applicant adds that the speed is also a consideration in the selection of the gate oxide thickness. This is a common design criteria known to those of routine skill in the art. The thickness controls the capacitance between the gate and the channel and thus the speed of the device. The selection of the thickness based on breakdown and speed is clearly a result effective variable that one of

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ordinary skill would have found obvious and in fact is just part of selecting or determining the optimum range (See below.)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the oxide of the output stage thicker than the lower voltage input stage so that the higher output stage amplifier can “reliably sustain higher voltages” as taught by Lu.

The combination made obvious above is silent on the specific thickness of the two oxide layers, the thinner and thicker layers, with the thicknesses of 70 Angstroms and 140 Angstroms. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide such thicknesses, since it has been held that discovering an optimum value or workable range of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

As to the forming of the RF power amplifier arrangement made obvious above on or in a single integrated circuit, it is well known that to integrate a circuit results in a device that is more compact, more reliable than using a circuit based on discrete elements or components.

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make for a more compact and more reliable structure in the device made obvious above by integrating that circuit on a single chip as is conventionally known in the art.

Applicant has added to the claims the language or language similar thereto:

wherein the first gate oxide thickness is related to desired breakdown voltage levels of devices in the input stage circuitry and the second gate oxide thickness is related to desired breakdown voltage levels of devices in the output stage circuitry.

This recites a fact of nature or an inherent fact of all FET structures, namely that the gate oxide is related to the breakdown voltage and hence is related to the desired breakdown voltage. Clearly a FET with larger gate oxide thickness for oxides of the same material can withstand higher breakdown voltages. The examiner is not sure what structure applicant is implying by reciting this function. However, the MPEP is clear that claims drawn to structure are to be distinguished from the prior art in terms of structure. (See MPEP 2114)

>an< apparatus must be distinguished from the prior art in terms of structure rather than function. >In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997)

From MPEP 2114

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The structure of the prior art inherently provides for this function. It is not clear what structure applicant may have actually meant for this phrase.

The claims remaining and the newly presented claims are directed toward a method which is an inherent part of the structure anticipated or made obvious above. For providing a cellular telephone apparatus is really just directed toward intended use and not to any new method step or new structure. However use of an amplifier in a cellular apparatus is a well known use for conventional amplifiers and accordingly it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the amplifier made obvious or anticipated above in such a manner. All the claims are really directed toward the amplifier structure and the inherent method of operation that is present therein.

Applicant's arguments with respect to claims of record have been considered but are moot in view of the new ground(s) of rejection. However applicant appears to believe that the rejection being more device orientated does not cover the method claims, the examiner respectfully disagrees. Yes the rejection recites the antenna or the cel phone usage that may not be present in the independent claims but the key feature with respect to the claimed invention is still there. Namely the two stages that have different potentials and Lu teaches that the gate oxide can be selected on how much the oxide is to withstand potential wise. This is really common sense for look at claim 63 for example where it says to identify the breakdown voltage level and then select the thickness based on this identification. Would someone of even routine skill select the oxide thickness to be one where it would breakdown? The answer is clearly not and when a result effective variables like the thicknesses of the oxide are selected or chosen the breakdown etc. are taken into consideration. The examiner sees no evidence of unexpected results and independent claims like claim 63 is just too broad to adequately define a particular operating point that would be characteristic of a typical unexpected result. Claim 73 plus has been added and the further criteria of speed has been added. Protection and speed with relationship to the gate oxide are just design criteria that a normal person of routine skill deals with or selects. The thickness determines the capacitance of the transistor and thus how quickly the device will react but the potential applied cannot be ignored as a FET that breaks down would mean that the device i.e. the ultimate circuit would quit working.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael B. Shingleton whose telephone number is (571) 272-1770.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Parker, can be reached on (571) 272-2298. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MBS
March 8, 2007
September 11, 2008
Dec 4, 2010

/Michael B. Shingleton/
Michael B Shingleton

Primary Examiner
Group Art Unit 2815